**Lesson 1.9 Notes**

Each of the tables below represents an arithmetic sequence. Find the missing terms in the sequence.

To find missing terms, we need to undo operations. Let's think about the explicit formula for an arithmetic sequence. $This\ term = common\ difference \cdot number\ of\ terms + f(0)$. If we don't have $f(0)$, we can think about using $f(1)$ as long as we use the difference between 1 and the term number we have. So, it might look something like:

$$Last\ term = common\ difference \cdot difference\ between\ number\ of\ terms + first\ term$$

| $x$ | 1 | 2 | 3 |
|---|---|---|---|
| $y$ | 5 | | 11 |

$11 = m \cdot 2 + 5$ $6 = m \cdot 2$ $m = 3$ We are adding 3 at each step.

The missing term is 8.

| $x$ | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| $y$ | 18 | | | | -10 |

$-10 = m \cdot 4 + 18$ $-28 = m \cdot 4$ $m = -7$ We are subtracting 7 at each step.

The missing terms are 11, 4, and -3.

| $x$ | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| $y$ | 12 | | | | | | -6 |

$-6 = m \cdot 6 + 12$ $-18 = m \cdot 6$ $m = -3$ We are subtracting 3 at each step.

The missing terms are 9, 6, 3, 0, and -3.

| $x$ | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| $y$ | 50 | | | 86 |

$86 = m \cdot 3 + 50$ $36 = m \cdot 3$ $m = 12$ We are adding 12 at each step.

The missing terms are 62, and 74.

| $x$ | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $y$ | 40 | | | | | 10 |

$10 = m \cdot 5 + 40$ $-30 = m \cdot 5$ $m = -6$ We are subtracting 6 at each step.

The missing terms are 34, 28, 22, and 16.

| $x$ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| $y$ | -23 | | | | | | | 5 |

$5 = m \cdot 7 - 23$ $28 = m \cdot 7$ $m = 4$ We are adding 4 at each step.

The missing terms are -19, -15, -11, -7, -3, and 1.

Describe the method used to find the missing terms in an arithmetic sequence.

$$Last\ term = common\ difference \cdot difference\ between\ number\ of\ terms + first\ term$$

Other important notes: